

# Black Canker

A common, slowly developing target canker of aspen

**Pathogen**—Black canker is caused by the fungus *Ceratocystis populicola* (part of the *C. fimbriata* complex). The disease is sometimes called Ceratocystis canker or target canker of aspen.

**Hosts**—The *C. fimbriata* complex occurs all over the world on diverse hosts, causing diverse types of diseases. The form that causes black canker on aspen apparently occurs occasionally on other *Populus* species and has been introduced to eastern Europe where it is more lethal than in America.

**Signs and Symptoms**—Black canker may occur anywhere along a stem or branch. Cankers are typically diamond-shaped or oval, and the margins are often flared out (figs. 1-3). They are generally blackish and the bark tends to break off as the cankers develop, leaving an exposed canker face. Narrow, concentric, annual callus ridges are visible in the wood of the canker face. Fruiting is microscopic and usually not seen.

**Disease Cycle**—The fungus may infect at wounds, and when the host is dormant, the fungus kills a patch of cambium and inner bark. When the host is active, it produces callus that partially grows over the wood under the killed bark. When the host is again dormant, the fungus resumes growth, killing the callus and an additional bit of bark and cambium. This sequence continues for many years, resulting in successive, concentric rings of callus that are visible in the wood inside the canker. Because of the concentric rings, this type of canker is called a target canker. As the callus is produced, it tends to alter the form of the stem, leading to flaring of the margins.

The pathogen produces minute, black perithecia in cankers, but they are not always produced and are difficult to observe. They are produced in spring at the border of the canker on tissues dead for at least a year. *Ceratocystis* species generally have adaptations for dispersal by insects, and this appears to be functional for black canker. Nitidulid beetles are attracted to the aroma of the fungus and may acquire the sticky spores from the fruiting bodies, which can be deposited again when the beetles visit fresh aspen wounds.

**Impact**—The incidence of infection varies greatly among stands, but it is not known if this is due to variation in resistance or due to stand/site factors that favor infection. Black canker develops slowly and normally does not kill trees directly (figs. 4-5). However, it has a number of impacts:

- Cankers deform the stem, resulting in cull if the trees are harvested for wood products.
- Cankers can predispose stems to snapping, resulting in premature mortality.
- Cankers frequently serve as points of infection for wood-decay fungi, further affecting the tree, causing additional cull, and increasing the likelihood of snapping and mortality.
- Cankers and associated decay create hazards to people and property in developed sites.



Figure 1. Large, black canker that shows diamond shape, flaring margin, lack of bark over canker, annual callus rings in wood, and that cankers are not always black. Photo: Jim Worrall, USDA Forest Service.



Figure 2. Another large black canker. Photo: Jim Worrall, USDA Forest Service.

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**Management**—Practical means of preventing infection are not known. Certainly, wounding should be avoided, but natural infection courts apparently lead to heavy infection in some stands. In timber stands, partial cutting of aspen is strongly discouraged, because the residual stand often deteriorates in 5-10 years. Therefore, where the disease threatens management objectives, early harvest/regeneration should be considered.



Figure 3. Closeup of black canker, showing the narrow, annual callus rings. Photo: Jim Worrall, USDA Forest Service.



Figure 4. Black canker in heavily-affected aspen stand. Photo: Jim Worrall, USDA Forest Service.



Figure 5. Black canker in heavily-affected aspen stand. Photo: Jim Worrall, USDA Forest Service.

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